

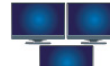


**Features:**

- 2 DDR4 SODIMM up to 32GB
- Three display ports support two independent displays: LVDS + DVI-I + HDMI\*/DP (DP available upon request)
- DP resolution up to 4096x2304 @ 60Hz Dual Channel LVDS resolution up to 1920x1200 @ 60Hz
- Multiple expansion: 1 PCIe x4, 2 Mini PCIe
- Rich I/O: 2 Intel GbE, 4 COM, 4 USB 3.0, 4 USB 2.0
- LPC EXT-RS232/485 module extends additional 4 COM ports



DDR4



2 Displays



Thin Mini-ITX



USB 3.0



15~36V DC-in



air gap ±15kv  
COM ESD Protection

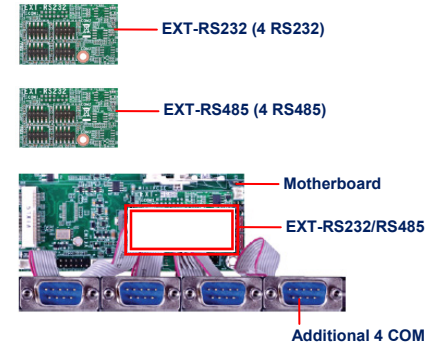
Product available until Q3 2022

<b>SYSTEM</b>	<b>Processor</b>	6th Generation Intel® Core™ Processors, LGA 1151 Socket Intel® Core™ i7-6700 Processor, Quad Core, 8M Cache, 3.4GHz (4.0GHz), 65W Intel® Core™ i7-6700TE Processor, Quad Core, 8M Cache, 2.4GHz (3.4GHz), 35W Intel® Core™ i5-6500 Processor, Quad Core, 6M Cache, 3.2GHz (3.6GHz), 65W Intel® Core™ i5-6500TE Processor, Quad Core, 6M Cache, 2.3GHz (3.3GHz), 35W Intel® Core™ i3-6100 Processor, Dual Core, 3M Cache, 3.7GHz, 47W Intel® Core™ i3-6100TE Processor, Dual Core, 4M Cache, 2.7GHz, 35W Intel® Pentium® Processor G4400, Dual Core, 3M Cache, 3.3GHz, 47W Intel® Pentium® Processor G4400TE, Dual Core, 3M Cache, 2.4GHz, 35W Intel® Celeron® Processor G3900, Dual Core, 2M Cache, 2.8GHz, 65W Intel® Celeron® Processor G3900TE, Dual Core, 2M Cache, 2.6GHz, 35W	
	<b>Chipset</b>	Intel® Q170 Chipset	
	<b>Memory</b>	Two 260-pin SODIMM up to 32GB	Dual Channel DDR4 1866/2133MHz
	<b>BIOS</b>	Insyde SPI 128Mbit	
<b>GRAPHICS</b>	<b>Controller</b>	Intel® HD Gen 9 Graphics	
	<b>Feature</b>	OpenGL 5.0, DirectX 12, OpenCL 2.1 HW Decode: AVC/H.264, MPEG2, VC1/WMV9, JPEG/MJPEG, HEVC/H265, VP8, VP9 HW Encode: MPEG2, AVC/H.264, JPEG, HEVC/H265, VP8, VP9	
	<b>Display</b>	1 x LVDS 1 x DVI-I (DVI-D signal) 1 x HDMI/DP (DP available upon request)	LVDS: dual channel, resolution up to 1920x1200 @ 60Hz DVI-I: resolution up to 1920x1200 @ 60Hz HDMI: resolution up to 2560x1600 @ 60Hz or 4096x2160 @ 24Hz DP: resolution up to 4096x2304 @ 60Hz
	<b>Dual Displays</b>	LVDS + DVI-I (DVI-D signal) + HDMI	LVDS + DVI-I (DVI-D signal) + DP
<b>EXPANSION</b>	<b>Interface</b>	1 x PCIe x4 (Gen 3)	1 x Half-size Mini PCIe (USB/PCIe/SATA, PCIe by default) 1 x Full-size Mini PCIe (USB/PCIe/SATA, SATA by default)
<b>AUDIO</b>	<b>Audio Codec</b>	Realtek ALC888S-VD2-GR	
<b>ETHERNET</b>	<b>Controller</b>	1 x Intel® I210AT PCIe (10/100/1000Mbps)	1 x Intel® I219LM PCIe with iAMT 11.0 (10/100/1000Mbps) (only Core i7/i5 supports iAMT)
<b>REAR I/O</b>	<b>Ethernet</b>	2 x GbE (RJ-45)	
	<b>USB</b>	4 x USB 3.0	
	<b>Display</b>	1 x DVI-I (DVI-D signal)	1 x HDMI/DP (DP available upon request)
<b>INTERNAL I/O</b>	<b>Serial</b>	1 x RS-232/422/485 (RS-232 w/ power) (2.00mm pitch) 3 x RS-232 (2.00mm pitch)	
	<b>USB</b>	4 x USB 2.0 (2.00mm pitch)	
	<b>Display</b>	1 x LVDS LCD Panel Connector 1 x LCD/Inverter Power	
	<b>Audio</b>	1 x Audio (Line-out/Mic-in) 1 x S/PDIF	
	<b>SATA</b>	2 x SATA 3.0 (up to 6Gb/s)	RAID 0/1/5/10
	<b>DIO</b>	1 x 8-bit DIO	
	<b>LPC</b>	1 x LPC (supports LPC EXT-RS232/RS485 module) (available upon request)	
	<b>SMBus</b>	1 x SMBus	
<b>WATCHDOG TIMER</b>	<b>Output &amp; Interval</b>	System Reset, Programmable via Software from 1 to 255 Seconds	
<b>POWER</b>	<b>Type</b>	Single 12V +/-10% DC (MBU4131) Wide Range 15~36V MBU4124)	
	<b>Connector</b>	DC-in Jack Right Angle Connector (4-pin) (available upon request) Vertical Type Connector (4-pin) (available upon request)	
	<b>Consumption</b>	MBU4131 Typical: i5 65W: 12V @ 2.15A (25.86Watt) Max.: i5 65W: 12V @ 5.84A (70.12Watt)	MBU4124 Typical: i5 65W: 12V @ 3.18A (38.16Watt) Max.: i5 65W: 12V @ 3.68A (69.92Watt)
	<b>RTC Battery</b>	CR2032 Coin Cell	
<b>OS SUPPORT</b>	<b>Microsoft/Linux</b>	Windows 7 (WEST) 32/64-bit Windows 8.1 (64-bit) Windows 10 IoT Enterprise 64-bit	Debian 8 (with VESA graphic driver) CentOS 7 (with VESA graphic driver) Ubuntu 15.10 (Intel graphic driver available)
<b>ENVIRONMENT</b>	<b>Temperature</b>	Operating: 0 to 60°C	Storage: -40 to 85°C
	<b>Humidity</b>	Operating: 5 to 90% RH	Storage: 5 to 90% RH
	<b>MTBF</b>	MBU4131 : 435,042 hrs @ 25°C; 256,660 hrs @ 45°C ; 165,275 hrs @ 60°C	MBU4124 : 420,421 hrs @ 25°C; 246,826 hrs @ 45°C ; 158,744 hrs @ 60°C Calculation model: Telcordia Issue 2, Method I Case 3 Environment: GB, GC – Ground Benign, Controlled
<b>MECHANICAL</b>	<b>Dimensions</b>	Mini-ITX Form Factor	170mm (6.7") x 170mm (6.7")
	<b>Height</b>	PCB: 1.6mm	Top Side: 20mm, Bottom Side: 7mm
<b>CERTIFICATIONS</b>		CE, FCC Class B, RoHS	

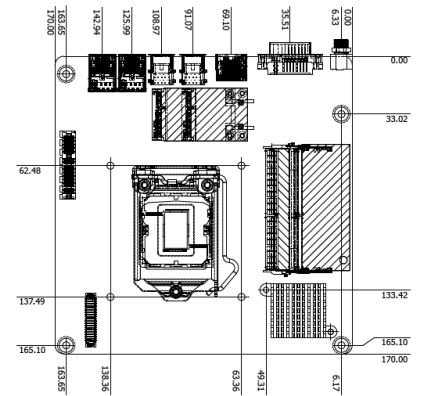
**Rear I/O**



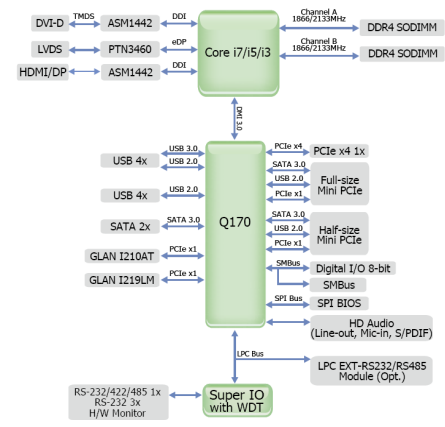
**2 Extension modules for additional 4 COM Ports (Via the LPC connector)**



**Mechanical Drawing**



**Block Diagram**



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